

For discussion at the April 18, 2012 SWG meeting

Ecology has up to \$200K available to support regional stormwater monitoring. The funds must be spent by June 30, 2013. Ecology would like to have SWG input as to which projects to pursue. Here is a list of potential project ideas, each of which will move a different component of SWAMPPS forward. Which ideas (below, or others suggested by work group members) are of the greatest need? What other funding sources can be leveraged? Who is interested in participating in each of the projects of greatest interest?

#### **IDEA #1: STREAMFLOW GAUGING ANALYSES**

Follow up on the Streamflow Gauging Network Analysis and continue to make progress toward defining the approach needed to monitor stormwater impacts on small streams over time. Specifically, propose which existing/historical gauges to maintain, identify which gauges might work as index gauges, and recommend which gauging locations to strategically add. Small Streams Status and Trends Subgroup to oversee. (See more detailed info, attached)

#### **IDEA #2: MUSSEL WATCH ANALYSES**

Continue to make progress toward defining the approach needed to monitor stormwater impacts on urban nearshore biota. Specifically, conduct a laboratory comparison analysis; OR expand the NEP-funded status study scheduled to take place this fall to include additional sites, parameters, media, etc. Marine Nearshore Status and Trends Subgroup to oversee. (See more detailed info, attached)

#### **IDEA #3: EFFECTIVENESS STUDIES WORKSHOP**

Host a one- or two-day workshop to winnow effectiveness study ideas and encourage partnerships among proposal proponents as a critical first stage in identifying what studies to fund with pooled resources of municipal stormwater permittees. Provide professional support to plan and facilitate the workshop to ensure broad and productive participation. This would be the SWG's fourth public workshop. Effectiveness Study Subgroup to oversee.

#### **IDEA #4: EFFECTIVENESS STUDIES SUBGROUP TECHNICAL SUPPORT**

Provide technical support to subgroup members working on crosswalk between literature review and list of study topics. Purchase publications as needed for RSMP use and reference. Deliver revised recommendations to work group through subgroup. Effectiveness Study Subgroup to oversee.

#### **IDEA #5: ROADS AND HIGHWAYS SUBGROUP PROJECT MANAGEMENT SUPPORT**

Provide project support (meeting logistics, note-taking, preparation of draft documents for subgroup discussion) to form a new subgroup that will develop recommendations for monitoring stormwater impacts of roads and highways and evaluating effectiveness of management approaches for these land uses. New Roads and Highways Subgroup to oversee.

#### **IDEA #6: SIDIR ANALYSES AND NEXT STEPS**

Build on the findings of Washington Stormwater Center's source identification and diagnostic monitoring literature review and IDDE and source control staff interviews. The report recommending specific next steps for creating the information repository is expected to be delivered to the work group in September 2012. Source ID Info Repository (SIDIR) Subgroup to oversee.

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## **Additional information on Idea #1: Streamflow Gauging Analyses**

From Chris Konrad:

US Geological Survey (USGS) recently completed an assessment of the current streamflow gaging network for monitoring the status and trends of small streams in the Puget Sound basin for the Stormwater Work Group. As a follow-up to that assessment, USGS will work with XX to investigate approaches for estimating streamflow at ungaged sites that can be used in the small stream monitoring strategy. The investigation has four specific objectives:

1. Identify the most important factors that account for correlation of streamflow between gages (e.g., basin area, geology, elevation, aspect, distance between basin centroids, etc.);
2. Characterize these factors for ungaged streams in the Puget Lowland (e.g., a table of ungaged streams with values for each factor);
3. Identify potential index gages for these streams, assess the uncertainty in streamflow estimates using a regression analysis that could be expected with these index stations, and identify types of basins that are under-represented in the current gaging network; and
4. List potential indicators of status and trends of small streams, analyze between-site differences and at-site trends over time using selected lowland sites, compare the statistical significance and power of indicators.

### **Products, Approach, and Cost by Task**

#### **1. Table of factors that account for correlation of streamflow between gages**

- QA basin delineation for each gage, edit accordingly
- GIS analysis (overlays) to tabulate physiographic factors for each gage site
- GIS analysis (spatial statistics) to tabulate relative measures (e.g., distance) between pairs of sites
- Regression analysis of factors and correlation between gages

Cost: \$45,000 (including report)

#### **2. Table of basin factors for ungaged streams**

- GIS analysis (overlays and spatial statistics) of ungaged streams (note that this step would be limited to streams greater than some nominal drainage area)

Cost: \$5,000

#### **3. List of index stations for ungaged streams**

Cost: \$5,000

#### **4. Analysis of trends and differences (between site) of selected indicators**

- Identify indicators
- Calculate values for existing gaging records
- Conducted statistical tests for trends and differences

Cost: \$25,000

## **Additional information on Idea #2: Mussel Watch Analyses**

From Jim West: Ideas for funds to help “kick start” MusselWatch expansion in Puget Sound in 2012

- 1) **Lab comparison study.** The first Puget Sound-wide evaluation of toxics in nearshore biota will occur in the fall/winter of 2012, with a field effort to expand existing NOAA coverage using mussels. To maintain consistency and comparability with an existing large database of long-term monitoring data on a wide range of species collected by the Puget Sound Ecosystem Monitoring Program’s (PSEMP) Toxics in Biota group, 2012 mussel samples will be analyzed for organic chemicals at NOAA’s Northwest Fisheries Science Center (NWFSC), and for metals at the King County Environmental Laboratory (KCEL). Although the analytical techniques used by NWFSC and KCEL are similar to those used by the NOAA Mussel Watch lab for historical mussel data, differences in accuracy may occur. In order to evaluate these differences we propose a one-time lab comparison study to quantify differences in tissue residue results between the historical Mussel Watch lab (B&B Laboratories of TDI-Brooks, College Station, TX), and the historical PSEMP laboratories (NWFSC and KCEL, Seattle, WA). With this comparison we seek to develop a correction factor that can be applied to data when they are combined.
  - \$79,000 would be required to pay for chemical analysis of mussel samples from ~30 sites, sent to B&B Laboratories of TDI-Brooks, College Station, TX. The Phase 2 expansion would provide matching funds for chemical analysis of the same 30 sites at the NWFSC and KCEL labs.
- 2) **Species comparison study.** Although mussels are relatively common in Puget Sound their abundance and distribution may not be sufficient to support expanded monitoring on the broadest geographic range in Puget Sound. We propose to use Pacific oyster (*Crassostrea gigas*) as a complement to the primary Mussel Watch species, mussels (*Mytilus* spp.) Pacific oysters are commonly used in other US states as Mussel Watch organisms – in general the west coast and northeastern states use mussels (*Mytilus* spp.), while the southeastern states use oysters (*Crassostrea virginica*). Both genera occur in Puget Sound. A comparison of contaminant uptake is needed to evaluate potential species differences that may otherwise preclude comparing the species.
  - \$30,000 would be required to pay for chemical analysis of oyster samples from ~30 sites at the NWFSC and KCEL labs. The Phase 2 expansion would provide matching funds for chemical analysis of mussels from the same 30 sites.
- 3) **Seasonal study.** Mussel sampling in Puget Sound has historically been conducted in the winter, to maximize exposure of organisms to predictable autumn/winter stormwater events. Understanding seasonal variation in contaminant loads would help elucidate seasonal pollution patterns, especially including the importance of antecedent dry periods on contaminant loading to biota. We propose to sample selected Mussel Watch expansion sites beyond their normal winter sampling to cover at least the three other seasons. The Snohomish County Marine Resource Committee has conducted similar studies for a few stations. We seek to replicate this approach across a wider range of shorelines and stormwater regimes across Puget Sound.
  - \$45,000 would be required to pay for chemical analysis of mussel samples from 5 sites (3 replicates/site) over 3 seasons (45 samples) at the NWFSC and KCEL labs. The Phase 2 expansion would provide matching funds for chemical analysis of mussels from the same 5 stations during one season.
- 4) **Caged vs. naturally occurring mussels study.** The national Mussel Watch program monitors only naturally occurring mussels in Washington. Although mussels are relatively common in Puget Sound, their distribution is not uniform along all shoreline types and natural populations may not occur in (or may disappear from) areas of interest to the Mussel Watch expansion. Transplanted or “caged” mussels have been proven as an effective tool for measuring exposure and bioeffects associated with chemical contamination (Salazar & Salazar, 1995). Caged mussels provide several advantages to naturally occurring populations; they can be strategically deployed at sites where resident mussels would not normally be found and along chemical gradients and near suspected sources of contamination, such as marinas or outfalls. Caged mussels also allow for control of exposure period and can help reduce variability associated with sampling natural populations. We propose deploying caged mussels at several Mussel Watch sites to allow for a comparison of contaminant uptake between caged vs. naturally occurring mussels to evaluate the effects of caging mussels, if any, on contaminant uptake.
  - \$30,000 would be required to pay for chemical analysis of caged mussel samples from ~30 sites at the NWFSC and KCEL labs. The Phase 2 expansion would provide matching funds for chemical analysis of naturally occurring mussels from the same 30 sites.